Driver Controlled Operation

Increase safety and maximise fleet availability

Driver Controlled Operation solution

Ensure the safe operation of passenger doors at the Platform Train Interface with our Driver Controlled Operation solution.

Driver Controlled Operation (DCO) is not just a camera system; it's a smart solution that enhances safety by providing low latency visual data to drivers of the Platform Train Interface (PTI) through utilising advanced technology.

By harnessing advanced IP camera technology, GNSS, odometry technologies, and intelligent displays, Petards Rail's DCO OTCM ensures live PTI coverage is available with maximum uptime and technical reliance. This enhances dispatch procedures and minimises risk to passengers during boarding and alighting of the train.

In summary, DCO is the key to bridging the gap between the train and the platform and ensuring safe operation, offering a level of digital information to train staff beyond standard means.

How it works

Petards Rail's DCO is modular in nature and integrates with an existing train network backbone to provide an agnostic system capable of expanding functionality with additional systems such as ASDO (Automatic Selective Door Operation) or internal CCTV. Using multiple sources of GPS and odometry readouts the position can be determined accurately and using either digital, or physical train connections, the correct side of the platform can be displayed.
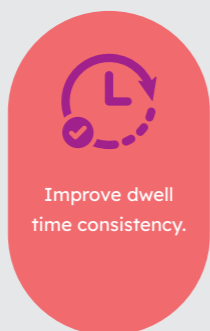
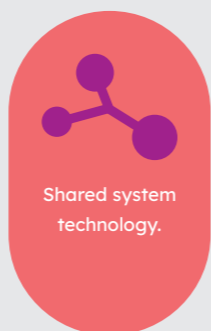## Key benefits

Enhanced safety at the platform train interface.	Adaptable to trains and station platforms.	Improve dwell time consistency.	Adhere to safety compliance.	Shared system technology.

Why choose the Petards Rail DCO system?

Tried, tested and trusted by fleets throughout the UK.

Our eyeTrain technology is designed to rail group standards, and incorporates the very latest in video, storage and communications technology branching into multiple functions for the rail industry.

Petards Rail's DCO OTCM solutions offer a reliable approach to solving the problem of suitable platform coverage within rail environments while remaining compliant to industry standards such as RIS-2703-RST and EN50155. Petards Rail supports from basic integrity up to SIL 2 and can adapt the compliant system boundary to meet your requirements.

Providing a solution which is highly adaptable and configurable for long term fleet strategies is a core concept of our DCO OTCM system where Petards Rail uses its extensive development experience to continuously develop functionality with advancing technologies.

Petards Rail's solution provides a significant advantage over platform mounted mirrors or screens by enabling the driver to monitor hazards after station departure.

Key benefits

- **Monitor platform** post-dispatch – On train cameras can provide footage beyond the limits of the station platform, improving safety and accident investigation data.

- **Approved** to Rail Industry Standard guidelines by the RSSB such as RIS-2703-RST.

- **Improving** dwell time consistency.

- **Increased safety** – Effective coverage of PTI and blind spots.

- **Modular design** – Our DCO OTCM solution can be installed modular and is adaptable to existing technology for your train or route geography. What's more, functionality can be expanded with **Automatic Side Door Operation** to combine DCO OTCM footage with automatic door selection for further enhanced safety functionality.

- **Certified solution** – Basic integrity up to SIL 2 approved system.

- **Greater route viability** – Allows for existing train configurations to safely operate on any station or platform. It is not restricted by availability of station guards for door monitoring where this is not possible.

- **Adaptable** – Integrates with train systems either digitally or physically to receive inputs to trigger system response.

An overview of the eyeTrain modular DCO system

At Petards Rail, we design our systems to be modular and adaptable to functions and integration requirements.

A typical standalone DCO OTCM system is shown in the diagram, though other compliant systems are possible depending on your train layout and geographical routes supporting up to 12 car trains.

Other functionality can be introduced to meet your requirements. This includes ASDO, saloon, forward facing, pantograph, track debris, Automatic Passenger Counting (APC), and PTeye cameras.

The system for DCO OTCM shares functionality with the systems described above, enabling simplified installation and upgrades over time. The minimal equipment required to provide a reliable, low latency solution makes this is a cost-efficient solution for both new and old rolling stock.

All the primary Line Replaceable Units (LRUs) are linked to a network switch either via PoE (Power over Internet), supplying both power and ethernet data connections up to 1000Mbps, or from a data only ethernet connection.

Shared components with other systems:

• NavMan and Antenna (third party supported)

• Network Switches

• Intelligent Cab Monitors (ICM)

• Network Video Recorder (NVR)

• Mobile Communications Gateway (MCG)

Our DCO OTCM system is complemented by our eyeBOS package. This enables remote access, from a central location, to the DCO OTCM system information such as live footage and system health, and is protected with user permissions and access controls. Video analytics can be supported depending on your application. Learn more by contacting **rail@petards.com**.
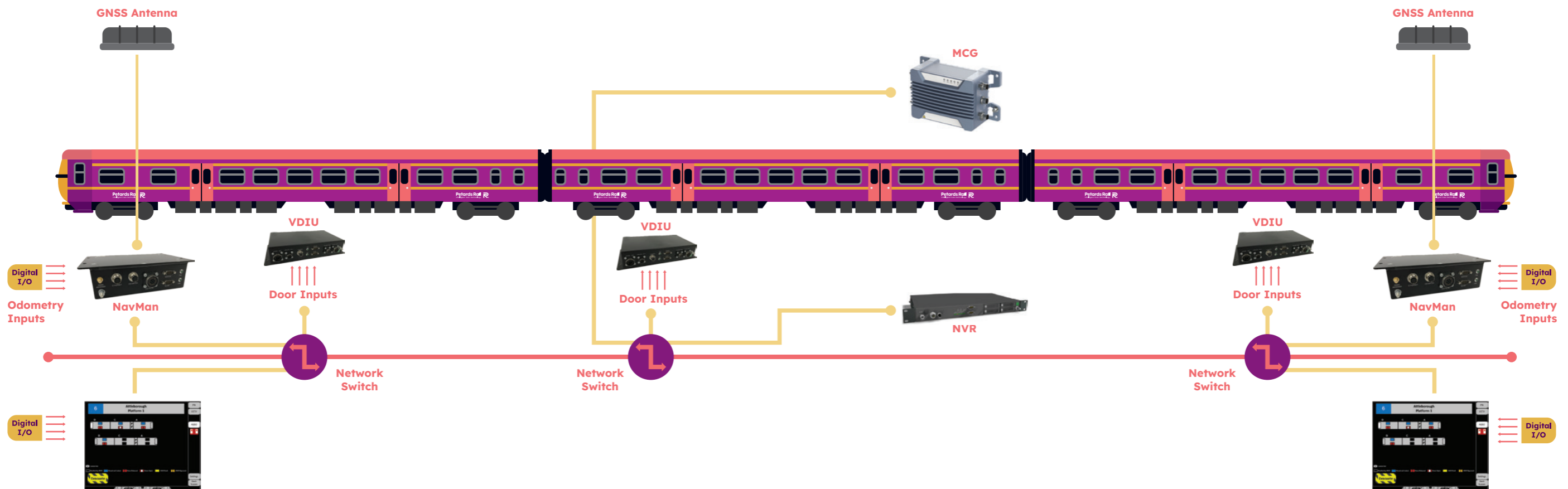
Intelligent Cab Monitor (ICM)

A resistive, full colour, touchscreen display designed to present low latency information in an interactive manner to train crew.

The Petards Rail system supports the installation of multiple, synchronised ICMs in each cab. The ICM can display video surveillance footage from any on-train networked camera. Connect it to third-party PIS to show passenger load data or to a TCMS, to display supplementary information and serve as a redundant TCMS monitor.

As a modular design, the ICMs can be operated in standalone mode and do not require TCMS integration but configurable ports can allow for integration if needed for connections to PIS or to display TCMS information.

The ICM is a key component in all applications relating to Petards Rail's eyeTrain system. With a powerful AI capable processor, it can be adapted to control many functions with a history of operation across multiple fleets in the UK and abroad.

Specification

Dimensions:

12.1" display: 360mm (W) x 250mm (H) x 99.5mm* (D)

10.4" display: 264mm (W) x 219mm (H) x 99.5mm* (D)

* Depth may vary depending on mating connector

Weight: (approximated)

12.1" display: 5.5kg

10.4" display: 2.5kg

Screen Resolutions:

800 x 600 SVGA or 1024 x 768 XGA

Power Supply:

10.4" display: PoE, IEEE802.3at Type 2

12.1" display: 110V DC

Power Consumption:

19W Typical, 30W Max

Temperature:

-25°C* to +55°C

* Storage temperature down to -40°C

IP Rating:

12.1" display: IP54 Front Face / IP2X Rear Face

10.4" display: IP65

Standards:

EN50155 - EN61373 - EN45545
EN60529 - EN50121-3-2

Related Functions:

ASDO - CCTV - APC - Pantograph - PTeye

Network Video Recorder

The NVR provides network storage to contain the video data and log files of the Petards Rail DCO OTCM system.

Video footage is recorded direct to storage media in a compressed, proprietary format and can be encrypted for additional security. Event data is partitioned in a separate database and protected for a maximum number of configurable events before overwriting. From the log files, valuable insights into operations and the overall health of the system can be gathered for data analysis and equipment monitoring. All data can either be accessed locally through a service port or transferred remotely to the wayside via Petards Rail's eyeBOS allowing live viewing or downloading of video footage to a central location.

The NVR also contains the configuration files for the Petards Rail ASDO system. The use of the NVR is multifaceted across various systems and is key for handling proactive maintenance strategies and providing operational insights.

Specification

Dimensions:

482.8mm (W) x 43.6mm (H) x 302mm* (D)

*Including 20mm for connection ports

NVR is mounted in a 19" 1U rack

Weight: (approximated)

5.8kg

Power Supply:

PoE, IEEE802.3af Mixed DC & Data (Mode A)

110V DC

Power Consumption:

30W Max (PoE), 40W Max (110V)

Temperature:

-25°C to +55°C

IP Rating:

IP2X

Standards:

EN50155 - EN61373 - EN45545
EN60529 - EN50121-3-2

Navigation Manager (NavMan) and Antenna

Accurate Global Positioning System (GPS) positions data from GNSS and odometry readings from vehicle tachometry to the Petards Rail system.

It records time synchronisation from the on-train GPS and feeds this into the ICM and NVR equipment for accurate metadata. Being directly fed into the onboard odometry readings the NVR can be notified of wheel slip/slide events and record this as an event within the CCTV system.

In DCO systems a NavMan is provided to receive date, time, GPS, and odometry readings, with third party inputs also supported if available. Data is provided to the rest of the system to record metadata against video footage and events for investigation purposes.

The NavMan always monitors itself and reports any faults to the overall Petards Rail system. This information is then logged and can be transmitted off train via a remote wayside communication or local connection on train. The NavMan utilises Digital I/O, SMA, RS485, Odometer M12 8Way Code, RS232, and PoE M12 D-code connections for functionality.

Specification

Dimensions:	Temperature:
245mm (W) x 65mm (H) x 179mm* (D)	-25°C to +70°C
* 130mm additional clearance required	**IP Rating:**
Weight:	IP65
4kg (Estimated depending on final configuration)	**Standards:**
Power Supply:	EN50155 - EN61373 - EN45545
PoE, IEEE802.3af Mixed DC & Data (Mode A) Class 0	EN60529 - EN50121-3-2
Power Consumption:	
5W (Estimated depending on final configuration)	

Driver Controlled Operation Camera

Advanced IP camera technology designed for the harsh rail environment and providing low latency footage to the DCO OTCM system.

The camera records external footage of the Platform Train Interface to the NVR and supports multiple independent video streams to provide low latency footage to driver monitors. All cameras are PoE powered requiring only a network switch connection to operate along with a built in DC powered heater capable of handling extreme temperature changes, minimising impact of condensation and ice on performance.

Infrared illuminators are included for maximum low light performance down to 0 lux while meeting colour performance down to standard station lighting according to RIS-7016-INS. A robust IK10+ vandal resistant, housing design minimises the ingress of dirt and water for long-term operation in rail.

Petards Rail also provides variants of design which can support analytics on edge, reducing the impact to available, on-train bandwidth, expanding functionality and future-proofing systems.

Specification

Dimensions:	Temperature:
122mm (W) x 180mm (H) x 59mm (D)	-40°C to +70°C (OT4/ST1 from EN50155)
Weight:	**IP Rating:**
0.81kg	IP68 and IP6K9K
Power Supply:	**Standards:**
PoE, IEEE802.3af Mixed DC & Data (Mode A)	EN50155 - EN61373 - EN45545
Power Consumption:	EN50121-3-2 - EN62262 - EN60529
Camera: 10.26W/6.08W (IR on/off)	
Heater: Variable up to 24W	

Why choose our rail solutions?

Petards Rail is an established and trusted partner to the rail industry. We combine our rich heritage, spanning four decades, with an innovative approach, to deliver cutting-edge data and video technology with exceptional customer service.

- We deliver modular systems for a highly configurable solution with optional independence from the TCMS – ideal for retrofit fleets.
- Our thousands of products in operation can be upgraded and modified for the latest developments in technology – without the obsoletion of systems.
- We harness the power of data with our eyeTrain Connect digital solution supporting all of our product range.
- Our EcoVadis Platinum sustainability rating and membership to the UN Global Compact are examples of initiatives within our commitments to Environmental Social Governance (ESG).
- We work closely with regulatory bodies to comply and improve standards to enhance the rail industry knowledge and importance of CCTV and safety critical systems.
- We comply to the latest international legislation and regulations:

  - ISO 9001   - ISO 14001
  - ISO 45001   - ISO 27001

We provide a suite of modular systems

ASDO – Ensure the safe operation of passenger doors at short platforms with our Automatic Selective Door Operation solution.

CCTV – Capture and replay high quality digital footage in real-time across our advanced IP camera range covering interior saloon, forward and rear facing, pantograph, and third rail.

APC – Adaptable technology using latest in camera video analytics or infrared technology for accurate passenger counting across a range of applications.

EyeTrain Connect – Improve your operations with the power of data to identify trends and make informed decisions for your fleets. Supported by our Service Level Agreements (SLAs) to provide valuable insights to your support team.

We have pride in our SPIRIT

Our values, which can be summarised as SPIRIT, are embodied in all that we do.

Safety
Safety is at the heart of everything we do. We take care of our employees, our customers, and the environment around us.

Responsive
We are responsive, even anticipatory, of our customers' needs and the market's evolving requirements.

Partnership
We develop long-term and trusted relationships with our customers, suppliers, and industry leading organisations to ensure we deliver the highest calibre solutions on time, in budget and to specification.

Integrity
We act fairly, ethically, responsibly, and sustainably in all that we do.

Innovation
We develop creative and intelligent solutions to advance our business, our service, and our technology roadmap. From our processes to our products, we prioritise continuous improvement and innovation.

Talent
We appreciate the skills, experience and attributes of our team and we will continually invest to harness, develop and nurture their talent.

Petards Rail R.
intelligent train technology